

Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/AU05/000356

International filing date: 16 March 2005 (16.03.2005)

Document type: Certified copy of priority document

Document details: Country/Office: AU
Number: 2004 902386
Filing date: 05 April 2004 (05.04.2004)

Date of receipt at the International Bureau: 19 April 2005 (19.04.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse



PCT/AU2005/000356

Australian Government

Patent Office
Canberra

I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004902386 for a patent by FRANK DANIEL LOTRIONTE as filed on 05 April 2004.

I further certify that pursuant to the provisions of Section 37 of the Patents Act 1990 Innovation Application No. 2004100252 was treated as a Provisional Application and reallocated no. 2004902386.



WITNESS my hand this
Fourteenth day of April 2005

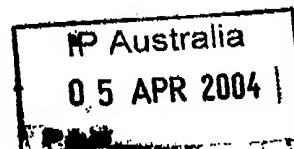
A handwritten signature in black ink, appearing to read 'J. Peisker'.

JANENE PEISKER
TEAM LEADER EXAMINATION
SUPPORT AND SALES

AUSTRALIA
Patents act 1990

COMPLETE SPECIFICATION
INNOVATION PATENT

SLOTTED BLADE WINDMILL IMPELLOR



The following statement is a full description of this invention , including the best method of performing it known to me :

SLOTTED BLADE WINDMILL IMPELLOR

Technical Category : Mechanical, electrical.

This invention aims at supplying the drive torque necessary for various applications including water pumping, ventilation, power generation etc. from a reduced product size and / or available wind speed / air flow with a specially designed impellor that maximises the conversion of airflow around and through it to available torque, by means of a unique blade design, that aims to convert the surrounding wind flow, as well as the wind "through-flow", to turning motion as efficiently as possible, and has shown to significantly increase the output of any rotating-blade type wind turbine of any given diameter and number of blades (which are typically wasteful and cumbersome) and can be highly cost effective when used in multi-impellor combinations. Also, this impellor design needs only to be pointed slightly away from the incoming wind direction in high winds or gales, to achieve a significant reduction in rotational speed allowing a safe, long working life of the entire unit without the need of expensive or complicated "blade pitch" altering mechanisms and is especially suitable for mass production in rigid plastics providing great usefulness in its intended design purpose.

DESCRIPTION

A number of "aero-foil shape" curved section "vanes" #1, containing therein close to their "leading edge" #6 (which is angled approximately 30-50 degrees from both the rotation axis and rotation direction (Figure 1) an array of slots #5, that also have a radius at their respective leading edges, with a longitudinal twist or helix increasing toward the rotation direction #2, protruding from the outer "windward" ends of an equal number of outwardly projecting blades containing a slightly increasing surface curvature in both their horizontal and vertical planes #3 thus also forming an "aero-foil shaped" curved surface and permitting seamless co-joining at the junction with their respective vanes, are all centrally connected and radially displaced around a central hub or shaft. #4

Note ; 'Leading edge' implies head-on to air flow at that point.

The impellor is constructed in such a way to allow cavity mouldability or vacuum forming in rigid plastics, forming in sheetmetal, steel, aluminium, either as one complete unit or to be assembled in sections by bolting, rivets, welding, encased moulding or similar.

ABSTRACT :

This invention essentially comprises of an impellor that is a conjunction / co-operation of 2 differing types of air flow deflection devices ,axial vanes #1 and radial blades #3 that with the aid of slots 5 # at their leading edges, provide a significant increase in the conversion of light to medium winds to available torque and consists of a number of individual outwardly projecting thin , slightly curved surfaces of aero -foil section (blades) inclined to act in reaction to the air flow , that have at their respective outer, most frontward , (windward) edges , a slotted , typically curved aero-foil section vane projecting substantially forward , of substantial length , twisted or slanted in a helix angle similar but slightly less than the inclination angle of the blades they are joined to , all being radially displaced and attached to a central hub rotating perpendicular to the windward direction.

The complete unit can be mounted via a shaft on a mast , enclosure or structure with self -orienting ability to windward and has proven to need only be aimed slightly away from the incoming wind direction to accomplish a rotating speed - limiting effect during a gale etc. or once maximum power output occurs to guard against failure.

The claims defining the invention are as follows :

1.
A fan or impellor that consists of a number of curved "aero-foil" section vanes that contain within, slots which are longitudinally orientated parallel to and in close proximity to their leading edges that is angled at approximately 30 -60 degrees from both the rotation axis and the direction of rotation, extending substantially forward in a "helical" fashion from the outer front "wind-ward" edges of an equal number of outwardly projecting blades having a slight outward surface curvature and aero-foil section, inclined at an angle slightly more than the twist or "helix" angle of the said "vanes" with respect to the rotation axis, thus permitting seamless co-joining at their respective junctions, that are all radially displaced around and connected to a central hub or shaft.
2.
A fan or impellor as claimed in claim 1 that has leading (towards airflow at that point) edges of the blades, vanes and slot edges contained within the vanes and/or blades, rounded with an elliptical radius to reduce wind drag.
3.
A fan or impellor as claimed in claim 1 and 2, that has an incidence or approach angle of its aero-foiled sectioned vanes and or blades always between 0 and 60 degrees, relative to air flow at that point, to provide the maximum possible deflective force acting on it with the minimum possible disruption to the said air flow.
4.
A fan or impellor as claimed in claims 1, 2 and 3 that is moulded or formed in rigid plastics or cast, forged, pressed or fabricated from sheet metal, steel or aluminium either as one unit or as assembled from individual components by riveting, bolting, welding etc.
5.
A fan or impellor as herein before described with references to Figures 1 - 3 of the accompanying drawings.

SLOTTED BLADE WIND MILL IMPELLOR

Frank D Lotrionte

1 - 4 - 2004

Figure 1
(Top View)

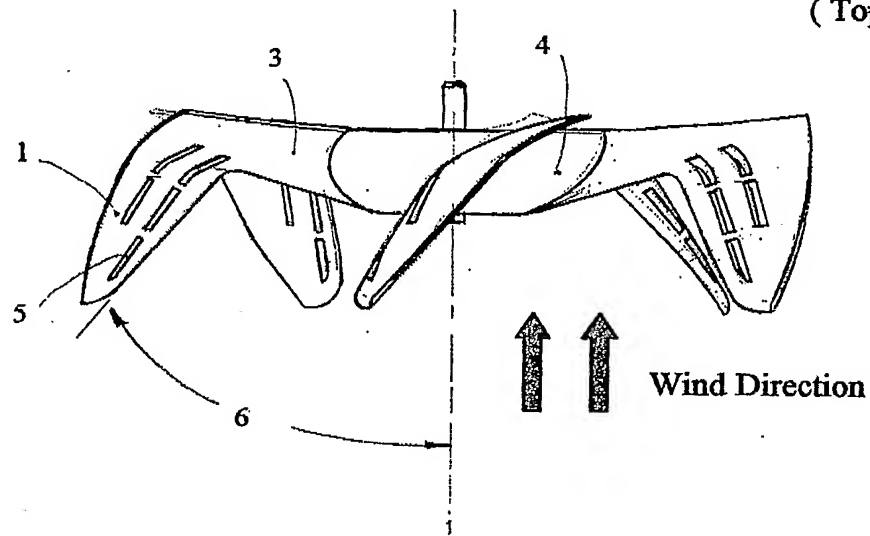


Figure 2
(Front view)

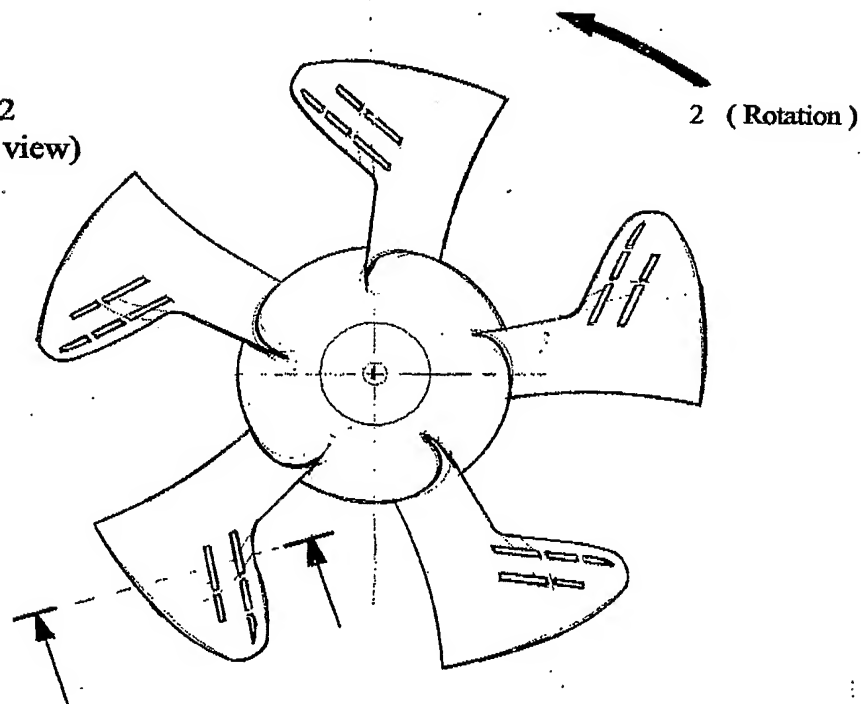


Figure 3
(Section view of vane)

